



## 2024-2025 AEESP Distinguished Lecturer

Dr. Lynn Katz, PhD

Professor and Hussein M Alharthy Centennial Chair in Civil Engineering  
University of Texas at Austin



Friday March 7<sup>th</sup>, 2025  
2:30 PM

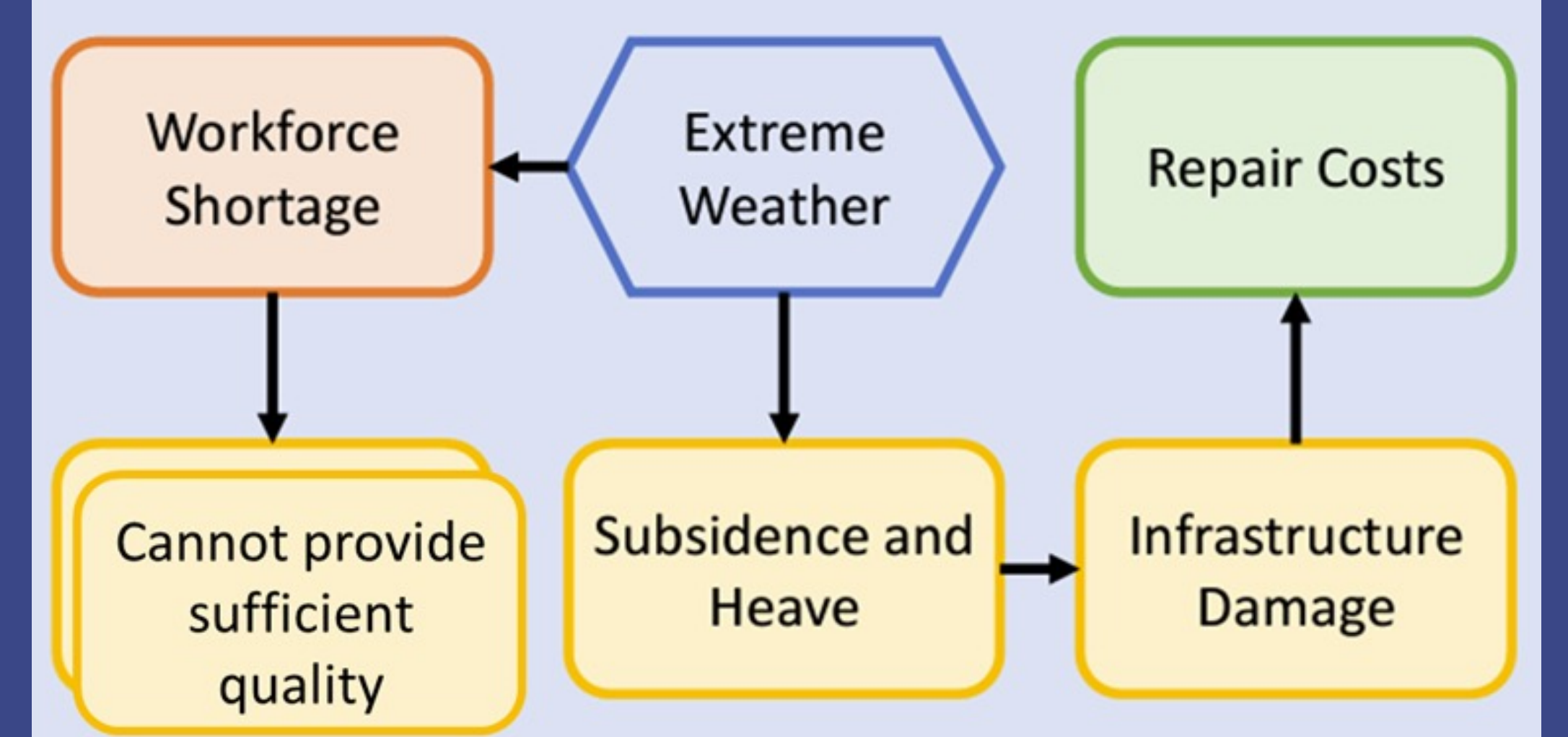
Student Union Building, Room 405/415  
Free and open to all.

# Drinking Water Quality in Rural Alaska: Addressing Socioeconomic Challenges from Molecular Level Insights

Providing water services in rural communities is complex, with environmental, economic, and social factors creating significant barriers. In Alaska, melting permafrost threatens infrastructure, geographic isolation complicates construction and maintenance, and workforce shortages lead to system neglect. Thousands of rural homes lack piped drinking water, relying instead on water haulers delivering to storage tanks every 1-4 weeks. Residents often turn to alternative water sources (i.e., rainwater, bottled water, snowpack) due to the poor aesthetic quality of delivered water. Utilities face additional challenges recruiting staff for processes requiring advanced certification, such as greensand filtration.

Continuous regeneration manganese greensand filtration is commonly used in Alaska to remove iron and manganese. This process oxidizes soluble contaminants to insoluble forms removed by greensand media. While effective, process optimization is hindered by complex interactions among oxidation, adsorption, and precipitation. For example, iron oxidation forms amorphous iron hydroxide solids, which can adsorb or co-precipitate arsenic, while arsenic presence impacts solid structure and process efficiency. These intricacies highlight the need for better understanding to guide operations in remote communities.

This presentation examines water quality from a groundwater-sourced treatment system serving homes in the Yukon-Kuskokwim region of Alaska. It addresses operational and delivery challenges, water quality issues, and treatment performance. Mechanisms of contaminant removal in precipitating systems are explored, alongside the impacts of climate change on Arctic infrastructure. Finally, strategies for climate adaptation in tundra communities are discussed, focusing on sustainable water delivery solutions.



### BIO

Dr. Katz has over thirty years of experience examining the application of aquatic surface chemistry to understanding the fate and transport of contaminants in the environment and toward the development of treatment technologies for contaminated water and soil. Her current research has a strong focus on improving water treatment for underserved communities. As a faculty member at the University of Texas, she has served as Chair of the Engineering Faculty Women's Organization, Chair of the Faculty Womens' Organization, co-chair of the University Faculty Gender Equity Council, Associate Chair of the Department of Civil, Architectural and Environmental Engineering and Chair of the Cockrell School of Engineering Faculty Promotion and Review Committee.

### Other Participating Institutions

